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ABSTRACT

The study attempts to provide valid research to answer parent concerns about whether Montessori education in the elementary grades prepares students for the real world. Begun in 1986, the study will last 18 years to follow participants through schooling and into adulthood. Subjects are assessed every 3 years. This follow-up is the third assessment. Participants were recruited from lower and upper elementary classes of the Franciscan Montessori Earth School. At this follow-up, participants and their parents and teachers completed a survey; students completed a personality measure and achievement tests. The study postulated two hypotheses: (1) the number of Montessori Education Years (MEY) would positively relate to those qualities emphasized in Montessori education, such as cooperation with peers; and (2) participants with any Montessori education would be at least as successful as the general population. Results found minimal support for the first hypothesis; the second hypothesis received considerable support. Participants were described as normal or healthy, and achievement tests results were above average for the general population. (TM)

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THE LONGITUDINAL ASSESSMENT STUDY (LAS)

CYCLE 3 (SEVEN YEAR) FOLLOW-UP

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ABSTRACT

The Longitudinal Assessment Study (LAS) was initiated in 1986 in order to assess the affects of a Montessori education on children into adulthood. The study was designed to last 18 years so that participants could be assessed through the school years and could include participants' adjustment related to family and career. Participants are assessed once every three years (one Montessori cycle). The LAS grew out of the need to establish valid and reliable outcome research as related to elementary and above education.

The primary hypothesis related to the LAS was that the number of Montessori Education Years (MEY) would be positively related to those qualities which are emphasized in the Montessori teaching environment. A secondary hypothesis was that participants with any Montessori education would be as successful as the general population.

For all variables, results for all sub-groups of the LAS population fell in the range which was best described as normal or healthy. In fact, achievement test results were above national norms on all scales. The secondary hypothesis of no negative difference from the general population was supported.

MEY, age, and participation status (currently Montessori enrolled or enrolled in other schools) were all inter-related. After appropriate statistical controls, MEY was positively related to ease of discussion of school day with parent and negatively related to number of minutes of chores done per week. Age was positively related to time spent on chores, negatively related to ease of discussion of school day with parent, and positively related to teacher rated ability to cooperate with peers. Current (usually public or private Christian school) teachers of former Montessori students rated the LAS participant (as compared to classmates) as better able to work alone, finish a product, handle stress, and they offered a higher overall academic rating than did the current Montessori teachers' ratings of LAS students. Achievement test complete battery mean was at the 68th national percentile. Many teacher reported variables had higher mean scores for females. Personality measure results showed remarkably normal and healthy participants. Considering participants who have been assessed all three times over seven years and remain in a Montessori environment (n=20), some changes in support of the primary hypothesis were noted. Teacher rated abilities to cooperate with peers and teachers, to handle stress, and overall social rating increased, and participant rated feelings about school increased as well.

Citing previous research showing that parents with philosophies of living compatible with Montessori theory were more likely to allow their children to continue in Montessori past the lower elementary level, it was suggested that direct assessment of participant philosophy over time would show movement in a Montessori-compatible direction. A tertiary hypothesis was suggested, that the number of MEY will be positively related to those qualities of philosophy which are emphasized in the Montessori method. Future assessments will add a qualitative assessment of participant philosophy.

ABOUT THE AUTHOR

Dr. Glenn is not a parent, a teacher, or Montessori trained. He received his Masters in Counseling from the University of Oregon in 1975 and his Doctorate in General Psychology from Texas Tech University in 1980. He has been associated with the Franciscan Montessori Earth School since 1983. If you know anyone who wants market research with a personal, humanistic touch, let him know! That is how he has made his living since 1986 in Portland, Oregon.

INTRODUCTION AND NOTE ON LITERATURE REVIEW

The Longitudinal Assessment Study (LAS) was initiated in 1986 in order to assess the affects of a Montessori education on children into adulthood. The study is designed to last 18 years so that participants can be assessed through the school years and can include participants' adjustment related to family and career. Participants are assessed once every three years (one Montessori cycle).

Participants are recruited from the Franciscan Montessori Earth School (FMES or the Earth School), where an active research program has been in place since 1984 (Glenn, 1993). With about 350 students, FMES, an AMI affiliate, has programs from Children's House through high school. Participants in lower and upper elementary classes are invited to join the LAS, and they are encouraged to remain in the LAS beyond their stay at the Earth School. Only about a quarter of all LAS participants have withdrawn, and we will find that only one variable showed a significant difference between current and withdrawn participants, so selection bias does not appear to be a factor.

As in many Montessori programs with elementary and higher levels, a concern among parents focuses on whether this alternative educational method is preparing the student for the 'real, stress-filled world.' Many parents feel Montessori is fine for pre-schoolers, perhaps acceptable for lower elementary aged children, but many have serious doubts for its effectiveness in developmental preparation for upper elementary and older aged children. Montessorians believe it works, but little in the way of scientific proof is available for the doubters. The LAS grew out of this need to establish valid and reliable outcome research.

The primary hypothesis related to the LAS is that the number of Montessori Education Years (MEY) will be positively related to those qualities which are emphasized in the Montessori teaching environment, such characteristics as self-control and self-direction, spontaneity, creativity, and the like. A secondary hypothesis is that participants with any Montessori education will be as successful as the population of similar students after leaving the Earth School.

Very few longitudinal studies assessing elementary aged and older children have been conducted related to the Montessori method. In fact, a recent computer generated review of the ERIC and PsycINFO data bases revealed no citations of longitudinal studies from 1986 to the present. Prior to 1986, some relatively short term longitudinal studies were conducted, and excellent and comprehensive annotated bibliographical and review articles by Boehnlein (1985, 1986, 1988) summarize these. On the whole, these studies usually found that Montessori educated students did at least as well as other educated students on achievement test and behavior measures.

DESCRIPTION OF STUDY

The first (Cycle 1) assessment in October, 1986 included a public school comparison sample, and some of these results were summarized in a previously published article (Glenn, 1989). Cycle 2 assessment was conducted in January, 1990 and included the original Montessori sample and added additional Montessori students. Cycle 3 assessment was done in January, 1993, and included all Cycles 1 and 2 Montessori students and added additional Montessori students.

A total of 198 participants have been members in the LAS, and 27% (n=53) have withdrawn. Table 1 summarizes the status of the currently active 145 participants: 34% of these 145 have been assessed for all three cycles, 34% were assessed for Cycles 2 and 3, and 32% are first time participants.

Every three years participants, their parents, and their teachers complete a survey. In addition, a personality measure is administered, and achievement test results are included if available. Future assessments will add a vocational preference inventory and will add questions related to marriage, family, and children. Participants no longer at the Earth School receive their packet by mail, since all items are self-administered, and all return postage is pre-paid. Privacy envelopes are provided to the participants in order to encourage honesty. Participants still at FMES are assessed on a class by class basis. Lower elementary students are administered their surveys and personality measures orally in order to neutralize differential reading abilities, and all older students complete their materials on a self-paced basis.

The personality measures were selected to be appropriate for normal and healthy persons, and because different versions from grade 1 through adult were available. They use common scales and were developed using a common personality theory (Cattell, 1957).

Cautions and Limitations. Due to constraints of time and budget, it has not been possible to maintain a comparison or control group. However, in compensation, many results in the LAS can be compared to national or published norms. These include the achievement tests and personality measure data. In addition, the teacher surveys of participants no longer at FMES ask the teacher to compare the LAS student with other students in the class. However, since the participant chooses which teacher is to complete the survey, teacher results may offer a best case scenario.

Regarding the personality measures, it has been established that gender differences are normal to expect (IPAT 1975, 1976, 1984), and since three different age versions were used, the test-by-gender sub-group samples were too small for in-depth statistical analysis. However, the results related to the personality measures will be discussed in a general format in the Gender sub-section.

Attrition in long term studies is a persistent problem, but a loss of 27% in the LAS can be considered quite favorable. Many of these participants chose to withdraw themselves (rather than a parent or an inability to track down an address change), often at the junior or senior high

school level, due to lack of interest or motivation. On the whole, attrition does not appear to be related to any particular LAS variable. Only one variable showed statistically significant differences between withdrawn and active members (participant self-rating of how good is your finished work, with the higher rating for the active members), but additional analysis of this variable showed this significance was most likely due to an increase in participant age rather than participation status.

RESULTS

This section will take a general summary approach, and numbers will be mentioned only occasionally in order to exemplify a significant relationship.

For all variables, results for all sub-groups of the LAS population fell in the range which is best described as normal or healthy. In fact, we will find that the achievement test results were above national norms on all scales. In other words, on the whole, the secondary hypothesis was supported. There was little difference from the general population when norms were available (achievement tests and psychological measures), and there was little difference among no longer at FMES participants as rated by their teacher, who compared the student with his or her (non-Montessori educated) classmates. We can at least feel assured that Montessori appears to do no harm!

Evaluating the primary hypothesis is not as simple as associating the number of Montessori education years (MEY) with the other LAS variables. In fact (and in common with much research in the social sciences), several variables were significantly interrelated. For example, there was a significant positive correlation between MEY and parent rated ability for participant to cooperate with peers. However, MEY was also significantly related to participant age. In order to evaluate the effects of MEY alone, the effects of age must be neutralized. The partial correlation between MEY and ability to cooperate with peers, after removing the effects of age, was no longer significant. Not only were MEY and age significantly correlated (r=.58, .000), but also participation status (still at FMES versus no longer at FMES) was significantly correlated with participant age (r=.51, .000). Note, however, that MEY was not related to participation status (r=-.08, .337).

Thus, all results were statistically controlled for one or more variables. MEY was controlled for age and status, age was controlled for MEY and status, and all other addressed variables (e.g., gender) were controlled for MEY, age, and status. Control was exercised statistically through the use of partial correlations, anova designs with covariates, and manova designs with covariates.

Rather than focusing solely on MEY, we will consider MEY, participant age, and participant status collectively (justified by their interrelationships). Afterward, we will consider achievement tests and grades, gender, then offer some suggestions related to changes over time.

Tables 2 through 8 contain the frequency and descriptive results of the full sample for all variables except the personality measures, and the reader is encouraged to review these tables for general understanding and background.

MEY, Age, and Status. As previously indicated, partial correlations and covariate anovas and manovas were used to control for interrelated effects. After partialing out the effects of age and status, only two variables were significant by MEY. After removing the effects of MEY and status, only three variables were significant by age. After removing the effects of MEY and age, four variables were significant by status.

Parents reported that participants with more MEY found it easier to talk with them about the school day. On the other hand, parents of older participants found it less easy to talk with them about the school day. Gender also played a factor here, where, controlling for MEY, age, and status, female participants were rated by parents as easier to talk with about school than were males. We appear to have two counteracting attributes working here. While a Montessori education seems to be encouraging parent-child school related discussions, at the same time, increasing age seems to be (expectedly) discouraging this type of discussion. On the other hand, we can say that parent-child school related discussions are more difficult among older children with less Montessori education. The effects of gender may have been compounded by the fact that 87% of parent surveys were completed by mothers. One can surmise that female children would find it easier to talk with mothers than fathers. There were too few parent surveys completed by non-mothers to control for this effect. However, the effects of gender appeared to affect all sub-groups evenly. Thus, gender can be considered as a compounding factor to the MEY and age interactions.

A particularly significant interaction was noted related to the parent reported number of minutes of non-paying chores per week done by the participant. MEY, age, and status (but not gender) all were interrelated with this variable. Higher mean minutes of chores per week were associated with less MEY, being older, and still being enrolled at the Earth School. The means are dramatically displayed in Table 9 and Graphs 1, 2, and 3. The interaction with age makes sense, and related to status, it is possible that participants no longer at the Earth School have more extra-curricular activities, leaving less time for chores.

In discussions with FMES staff and older (junior and senior high) students, some hypotheses were suggested. Regarding MEY, perhaps parents of children with more MEY are less likely to label some jobs as chores. This can be considered consistent with Montessori philosophy, where chores can be seen as something natural to do. Thus, students with more MEY may not be doing less minutes of chores, but rather they may be doing a similar amount, but not calling them chores. An alternate explanation could be that participants with more MEY have learned better negotiation skills, enabling them to more effectively talk themselves out of doing chores.

By age, teachers reported that the older the students, the better able they were to cooperate with their peers.

Four other teacher reported variables were significant by participation status. Current (usually public or private Christian school) teachers of former FMES students rated the LAS participant (as compared to classmates) as better able to work alone, finish a product, handle stress, and they offered a higher overall academic rating than did the current Montessori teachers' ratings of LAS students still at FMES. Although participants no longer at FMES could choose the teacher of their choice to complete the survey (as opposed to Earth School participants for whom their primary teachers completed the surveys), these four ratings offer considerable support for the secondary hypothesis.

Achievement Test Results and Grades. All students at FMES age 8 and over are annually administered the Stanford Achievement Test. In addition, parents of former Earth School LAS participants are encouraged to submit copies of recent achievement tests and report cards. Assignment of grades at FMES is elective and only for junior high and older students. Nearly three-fourths (73%) of current FMES students were old enough to complete achievement tests, 40% of former FMES students submitted achievement test results, and 68% of them submitted recent report cards.

For all participants combined, all scales were above the 50% national percentile (Table 8). The lowest was spelling at the 54th percentile, and the highest was listening at the 78th percentile. For complete battery, only 12 participants (13%) were below the 50th percentile, and 15 (16%) were above the 90th percentile.

There were a few significant interactions. After controlling for MEY and age, former students (78th percentile) were higher in total mathematics than were current students (52nd percentile). After controlling for MEY, age, and status, females scored higher than males on total language (71st to 54th percentile), basic battery (70th to 58th percentile), and complete battery (73rd to 61st percentile). Finally, parent income was positively related to all scales except total mathematics.

The overall grade point average, using a A=4 to F=0 scale, for all 16 former Earth School students who submitted grades, ranged from 1.17 to 4.00. The grand mean was 3.38, only 3 participants fell below 3.00, and 8 participants had a 4.00 average. Over half (56%) of all 185 individual grades for all areas were As, 34% were Bs, 6% were Cs, 3% were Ds, and 2% (n=3) were Fs.

Although it may be suggested that former FMES participants with poor grades or achievement test scores were less likely to submit them, the students who did so suggest that FMES has successfully prepared them for other educational environments. That all scales for current FMES participants were above the 50th national percentile strongly suggests that these skills were learned at FMES and have been carried over to other educational environments.

Gender. Results for gender were controlled for MEY, age, and status. We noted in a previous sub-section that gender played a factor in ease of discussion of the school day with parents, where parents of females rated it easier to talk about school than did parents of males. However,

also noted was that the large majority of parent surveys (87%) were completed by mothers, and same gender interactions could be considered easier than cross-gender interactions.

Several teacher reported variables were significant by gender, and in all cases, females were rated more positively or higher than were males, although all means for both genders were on the positive side of the scales. Teachers rated females higher in rate of school adjustment, ability to work in groups and alone, difficulty to distract, ability to finish a product, overall academic rating, level of self-confidence, ability to cooperate with teachers, showing grace and courtesy, showing compassion for others, ability to handle stress, self-image, and overall social adjustment. In addition, female participants themselves offered a higher 'like' rating for school than did males. Even on the scales which did not show a statistical difference, in nearly all instances, females received higher means than did males.

We cannot say that, collectively, females are better at school than males. What we can say is that teachers perceive females as more willing and eager classroom participants, and that, in general, they perceive females as doing better academically than males.

Pertaining to the personality measures, gender-based differences were expected and observed. Compared to the mid-1960's norms, males tended to be abstract thinkers, not impatient or aggressive, sensitive, relaxed, and self-confident, and females tended to be abstract thinkers, active, assertive, group-oriented, and self-confident. These personality measure results most likely reflect the changing culture as it relates to gender since the 1960's and as such offer (1) face validity of the measures themselves and (2) support for the secondary hypothesis that there is no significant difference between the Montessori sample and the general population.

Changes Over Time. This section analyzes a sub-set of LAS participants, the 20 people who have been in the LAS for all three assessment cycles and who have remained at FMES. The latter was specified in order to focus on the effects of 6 years of Montessori education without the effects of any other education. For the parent and teacher surveys, we have three sets of data, but the student survey was developed after Cycle 1, so only two sets of data are available for it. Because of the small sample, we cannot analyze gender-specific personality measure data.

It is likely that the effects of MEY and age interact here as indicated in our previous discussions. However, as we are measuring separate variables over time, the previous partial correlation and covariate designs are not appropriate. Thus, results in this section must be considered as suggestive only. The nonparametric Wilcoxon test was used to compare related interval scaled variables over time.

Among this sub-sample of 20 participants, parent income increased from Cycle 1 to Cycle 2, but not to Cycle 3. Mother education did not increase from Cycle 1 to Cycle 2, but it did increase at Cycle 3. Father education increased at each Cycle.

From Cycle 1 to Cycle 2, parents reported it becoming less easy to talk with their children about feelings, but there was no difference from Cycle 2 to Cycle 3. Parent rated ability for their child

to cooperate with both peers and adults showed similar trends, where Cycles 1 and 2 did not differ but an increase in ability was noted at Cycle 3. Both of these findings may be primarily age related.

Teacher rated ability for the student to work alone increased gradually from Cycle 1 to Cycle 3. Ability to finish a product, and abilities to cooperate with teachers and peers, increased from Cycle 1 to Cycle 2, but they did not change at Cycle 3. In a previous section we established that the latter ability was found to be related to age as well. Ability to handle stress increased from Cycle 1 to Cycle 2, but not to Cycle 3. Overall social adjustment was not assessed at Cycle 1, but it increased from Cycle 2 to Cycle 3.

Finally, participant rated feelings about school were assessed only in the latter two cycles, but an increase in positive feelings about school was noted from Cycle 2 to Cycle 3.

CONCLUSION

While the primary hypothesis (the number of MEY will be positively related to those qualities which are emphasized in the Montessori teaching environment) did not receive much support, neither was it opposed. The secondary hypothesis (participants with any Montessori education will be as successful as the population of similar students) received considerable support. At the 7 year follow-up of this 18 year study, we can say that, while number of Montessori education years did not appear to be a strong factor in home, school, personal, or personality adjustment, neither did a Montessori experience (of any length) adversely affect the LAS sample in any way. Achievement test scores for both the participants still at FMES and no longer at FMES were above the national norms on all scales. Looking at just the participants who are no longer at FMES, teachers rated them as equal or superior to their classmates.

In terms of changes over time (considering the small sample of participants assessed at all three cycles and still remaining at FMES), only positive ones were noted, but it was possible that age played a factor in several of these changes. In particular, ability to cooperate (assessed by parents and teachers, related to peers and adults) showed consistent increases, and while such ability can be considered a general developmental trait, it is also of core importance in the self-directed Montessori environment. Abilities to work alone and to finish a product are also core to Montessori, and these showed increases over time.

While the primary hypothesis may receive support at future assessments, with only the secondary hypothesis supported, parents may question the considerable monetary investment necessary for a private school education. Several research projects at FMES (Glenn, 1993) have suggested that parents who tend to stick with a Montessori education beyond the lower elementary years also tend to have a philosophy of living more compatible with Montessori philosophy than parents who do not stay at the Earth School. If we can say that, among parents, a personalized Montessori philosophy of living is associated with their child's Montessori education, we can suggest that this philosophy of living will become manifest among the

children (i.e., LAS participants) as they receive more Montessori Education Years. Thus, a tertiary hypothesis suggests itself, that the number of MEY will be positively related to those qualities of philosophy which are emphasized in the Montessori method.

To scientifically assess one's philosophy of living is in fact not impossible. Likely in future LAS Cycles will be the establishing of a sub-sample of participants who have had many (perhaps 10 or more) Montessori education years and who are motivated to provide developmental information over time. This sub-sample will receive in-depth qualitative assessments, such as confidential personal interviews or essay responses to open-ended questions. This qualitative (including personal philosophy) information can be content analyzed for common themes, then coded for limited quantitative analysis in relation with the other LAS variables in the larger LAS data base.

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TABLE 1
PARTICIPANT STATUS
(ACTIVE PARTICIPANTS ONLY)

	LAS PARTICIPATION STATUS				TOTAL	
	STILL AT FMES		NOT AT FMES		COUNT	PERCENT
	COUNT	PERCENT	COUNT	PERCENT		
All 3 Cycles	20	20.4%	29	61.7%	49	33.8%
Cycles 2 & 3	31	31.6%	18	38.3%	49	33.8%
Cycle 3 Only	47	48.0%			47	32.4%
TOTAL	98	100.0%	47	100.0%	145	100.0%

TABLE 2
PARENT REPORTED CATEGORICAL VARIABLES
(ACTIVE PARTICIPANTS ONLY)

	COUNT	PERCENT
WHO FILLED OUT SURVEY?		
Mother	119	86.9%
Father	11	8.0%
Guardian	1	.7%
Mother and Father	6	4.4%
TOTAL	137	100.0%
MARITAL STATUS		
Married	117	80.7%
Separated	4	2.8%
Divorced	19	13.1%
Widowed	1	.7%
Unmarried, Living With	3	2.1%
Single, Never Married	1	.7%
TOTAL	145	100.0%
PARENT REPORTED HIGHEST LEVEL OF EDUCATION WANTED FOR PARTICIPANT		
Finish College	47	33.6%
Some Graduate School	10	7.1%
Finish Graduate School	83	59.3%
TOTAL	140	100.0%
PARENT REPORTED HIGHEST LEVEL OF EDUCATION EXPECTED FOR PARTICIPANT		
High School	4	2.8%
Some College	4	2.8%
Finish College	65	46.1%
Some Graduate School	12	8.5%
Finish Graduate School	56	39.7%
TOTAL	141	100.0%
GENDER OF PARTICIPANT		
Male	68	46.9%
Female	77	53.1%
TOTAL	145	100.0%

TABLE 3
PARENT REPORTED SCALED VARIABLES
(ACTIVE PARTICIPANTS ONLY)

	Mean	S.D.	Median	Sample
AGE OF PARTICIPANT	11.49	2.80	11.50	145
NUMBER OF MONTESSORI EDUCATION YEARS	6.46	2.65	6.00	145
INCOME IN THOUSANDS	66.53	35.81	60.00	132
MOTHER EDUCATION	17.46	2.74	17.00	144
FATHER EDUCATION	18.01	3.61	18.00	143
TALK ABOUT SCHOOL DAY (1=HARD TO 5=EASY)	3.88	.96	4.00	145
TALK ABOUT FEELINGS (1=HARD TO 5=EASY)	3.82	1.04	4.00	145
ABILITY TO COOPERATE WITH PEERS (1=POOR TO 5=GOOD)	4.14	.85	4.00	145
ABILITY TO COOPERATE WITH ADULTS (1=POOR TO 5=GOOD)	4.45	.70	5.00	143
SCHOOL ATTITUDE (1=NEGATIVE TO 5=POSITIVE)	4.25	.79	4.00	145
FOLLOWER=1, EVEN MIX=3, LEADER=5	3.49	.89	3.00	145
NUMBER OF REMINDERS TO DO CHORES	2.63	1.12	3.00	145
MINUTES OF CHORES PER WEEK	106.43	102.60	70.00	143

TABLE 4
TEACHER REPORTED CATEGORICAL VARIABLES
(ACTIVE PARTICIPANTS ONLY)

	COUNT	PERCENT
TEACHER REPORTED SUBJECT AREA OF BEST PERFORMANCE		
Math	34	29.8%
Language Arts/English	20	17.5%
History	13	11.4%
Science/Computer	11	9.6%
Writing	11	9.6%
Art/Drama	11	9.6%
Reading	6	5.3%
Social/Cultural Studies	3	2.6%
Thinking Skills	2	1.8%
Other	3	2.6%
TOTAL	114	100.0%
TEACHER REPORTED SUBJECT AREA OF SECOND BEST PERFORMANCE		
Math	25	23.4%
Language Arts/English	25	23.4%
History	13	12.1%
Science/Computer	9	8.4%
Writing	4	3.7%
Art/Drama	6	5.6%
Reading	11	10.3%
Social/Cultural Studies	8	7.5%
Thinking Skills	3	2.8%
Other	3	2.8%
TOTAL	107	100.0%

TABLE 5
TEACHER REPORTED SCALED VARIABLES
(ACTIVE PARTICIPANTS ONLY)

	Mean	S.D.	Sample
NUMBER OF SCHOOL YEARS TEACHER KNEW STUDENT	2.22	1.85	133
RATE OF SCHOOL ADJUSTMENT (1=SLOW TO 5=QUICK)	3.94	.85	133
ABILITY TO WORK IN GROUPS (1=POOR TO 5=GOOD)	3.74	1.03	133
ABILITY TO WORK ALONE (1=POOR TO 5=GOOD)	4.07	.99	133
EASE OF DISTRACTION (1=EASY TO 5=HARD)	3.47	1.17	132
ABILITY TO FINISH A PRODUCT (1=POOR TO 5=GOOD)	3.92	1.08	133
OVERALL ACADEMIC RATING (1=BELOW AVERAGE TO 5=ABOVE AVERAGE)	3.94	.89	133
LEVEL OF SELF-CONFIDENCE (1=INSECURE TO 5=CONFIDENT)	3.68	.97	133
ABILITY TO COOPERATE WITH TEACHERS (1=POOR TO 5=GOOD)	4.21	.90	133
ABILITY TO COOPERATE WITH PEERS (1=POOR TO 5=GOOD)	3.73	.98	133
SHOWING GRACE & COURTESY (1=RARELY TO 5=OFTEN)	3.79	.95	133
SHOWING COMPASSION FOR OTHERS (1=RARELY TO 5=OFTEN)	3.94	.95	125
ABILITY TO HANDLE STRESS (1=POOR TO 5=GOOD)	3.30	.94	122
APPROPRIATE USE OF SPONTANEITY (1=RARELY TO 5=OFTEN)	3.67	1.09	131
OVERALL SELF-IMAGE (1=POOR TO 5=GOOD)	3.68	1.02	133
OVERALL SOCIAL ADJUSTMENT (1=BELOW AVERAGE TO 5=ABOVE AVERAGE)	3.64	.93	132

TABLE 6
PARTICIPANT REPORTED CATEGORICAL VARIABLES
(ACTIVE PARTICIPANTS ONLY)

	COUNT	PERCENT
PARTICIPANT REPORTED SUBJECT AREA OF BEST PERFORMANCE		
Math	50	37.6%
Language Arts/English	25	18.8%
Reading	11	10.3%
History	10	7.5%
Reading	8	6.0%
Science/Computer	7	5.3%
Writing	6	4.5%
Thinking Skills	1	.8%
Other	7	5.3%
TOTAL	133	100.0%
PARTICIPANT REPORTED HIGHEST LEVEL OF EDUCATION WANTED (AGE 9 AND OVER ONLY)		
High School	1	.9%
Some College	4	3.5%
Finish College	38	33.6%
Some Graduate School	9	8.0%
Finish Graduate School	61	54.0%
TOTAL	113	100.0%
CATEGORY OF JOB EXPECTATION (AGE 9 AND OVER ONLY)*		
Realistic	3	3.0%
Investigative	35	34.7%
Artistic	26	25.7%
Social	21	20.8%
Enterprising	15	14.9%
Conventional	1	1.0%
TOTAL	101	100.0%

* Realistic jobs include skilled trades, labor, and technical jobs.
Investigative jobs include scientific and some technical jobs.
Artistic jobs include artistic, musical, and writing jobs.
Social jobs include teaching and social welfare jobs.
Enterprising jobs include sales and managerial jobs.
Conventional jobs include office or clerical jobs.
(Holland, 1973, 1979)

TABLE 7
PARTICIPANT REPORTED SCALED VARIABLES
(NOTE: TEST TAKING ABILITY ONLY FOR FORMER-FMES PARTICIPANTS)
(ACTIVE PARTICIPANTS ONLY)

	Mean	S.D.	Sample
FEELINGS ABOUT SCHOOL (1=DISLIKE TO 5=LIKE)	3.94	1.07	145
COMFORT WITH TEACHER (1=NERVOUS TO 5=RELAXED)	4.25	.95	145
PERCEIVED TEACHER EXPECTATIONS (1=TOO LITTLE TO 5=TOO MUCH)	3.19	.82	145
COMPARED TO CLASSMATES, TIME TO FINISH WORK (1=MORE TO 5=LESS)	3.11	1.09	145
COMPARED TO CLASSMATES, ABILITY PAY ATTENTION WHEN NOISY(1=WORSE TO 5=BETTER)	3.21	1.22	145
COMPARED TO CLASSMATES, QUALITY OF FINISHED WORK (1=WORSE TO 5=BETTER)	3.55	.87	145
COMPARED TO CLASSMATES, ABILITY TO MAKE FRIENDS (1=WORSE TO 5=BETTER)	3.34	1.14	145
GENERAL TEST TAKING ABILITY (1=POOR TO 5=GOOD)	3.77	1.05	141
ABILITY WHEN TAKING TRUE AND FALSE TESTS (1=POOR TO 5=GOOD)	4.21	.88	47
ABILITY WHEN TAKING MULTIPLE CHOICE TESTS (1=POOR TO 5=GOOD)	4.37	.71	46
ABILITY WHEN TAKING FILL-IN-THE-BLANK TESTS (1=POOR TO 5=GOOD)	3.91	1.01	46
ABILITY WHEN TAKING ESSAY AND SENTENCE COMPLETION TESTS (1=POOR TO 5=GOOD)	3.81	.92	47

TABLE 8
ACHIEVEMENT TEST PERCENTILE SCORES
(ACTIVE PARTICIPANTS ONLY)

	Mean	S.D.	Median	Sample
TOTAL READING	75.97	23.12	82.00	91
TOTAL MATHEMATICS	58.96	26.59	61.00	91
TOTAL LANGUAGE/ENGLISH	63.58	25.26	69.00	84
SPELLING	54.33	28.89	52.00	79
STUDY SKILLS	68.30	26.50	78.00	79
SCIENCE	74.63	22.77	82.00	72
SOCIAL SCIENCE	74.72	20.72	77.50	72
LISTENING	77.63	23.23	89.00	67
USING INFORMATION	60.18	25.28	62.00	67
THINKING SKILLS	75.53	21.28	79.00	74
BASIC BATTERY	64.54	23.06	66.00	72
COMPLETE BATTERY	67.80	22.12	69.00	74

TABLE 9
MEAN MINUTES OF CHORES PER WEEK
(ACTIVE PARTICIPANTS ONLY)

NUMBER OF MONTESSORI EDUCATION YEARS (MEY):

CONTROLLED FOR AGE, STATUS	1-3 MEY	4-6 MEY	7-9 MEY	10+ MEY
MINUTES OF CHORES PER WEEK	151.36	146.69	83.80	25.88

PARTICIPANT AGE:

CONTROLLED FOR MEY, STATUS	6-9.9YRS	10-11.9YRS	12-13.9YRS	14+YRS
MINUTES OF CHORES PER WEEK	39.38	100.94	125.46	173.48

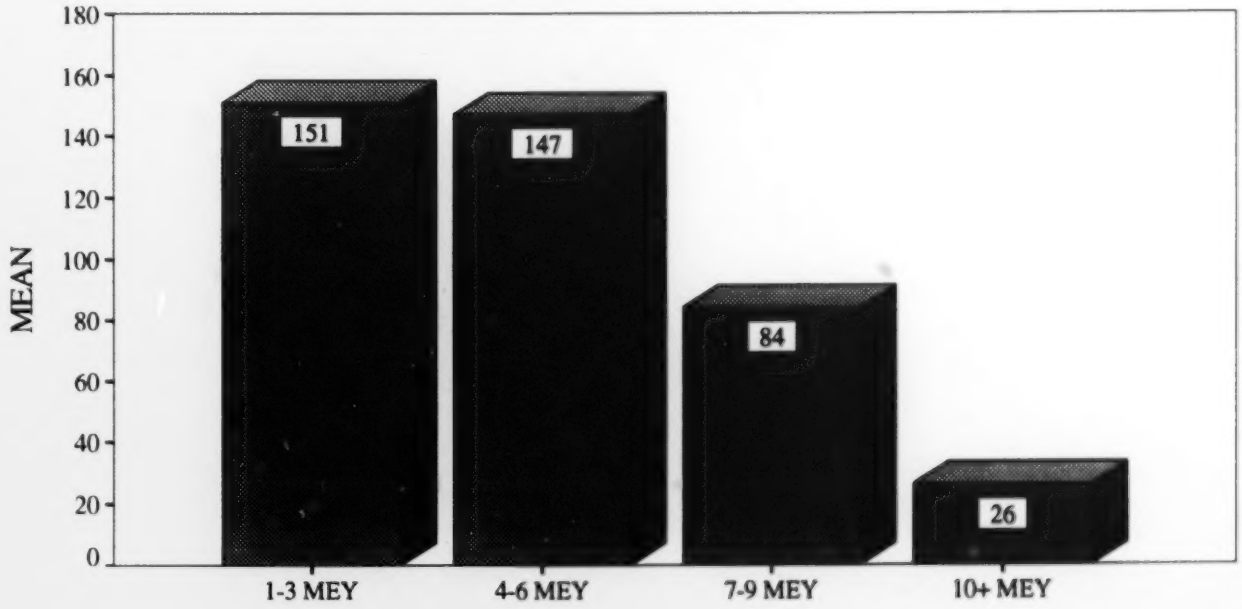
PARTICIPATION STATUS:

CONTROLLED FOR MEY, AGE	STILL AT FMES	NO LONGER AT FMES
MINUTES OF CHORES PER WEEK	138.89	74.40

GRAPH 1

MEAN MINUTES OF CHORES PER WEEK

CONTROLLING FOR AGE AND STATUS



NUMBER OF MONTESSORI EDUCATION YEARS (MEY)

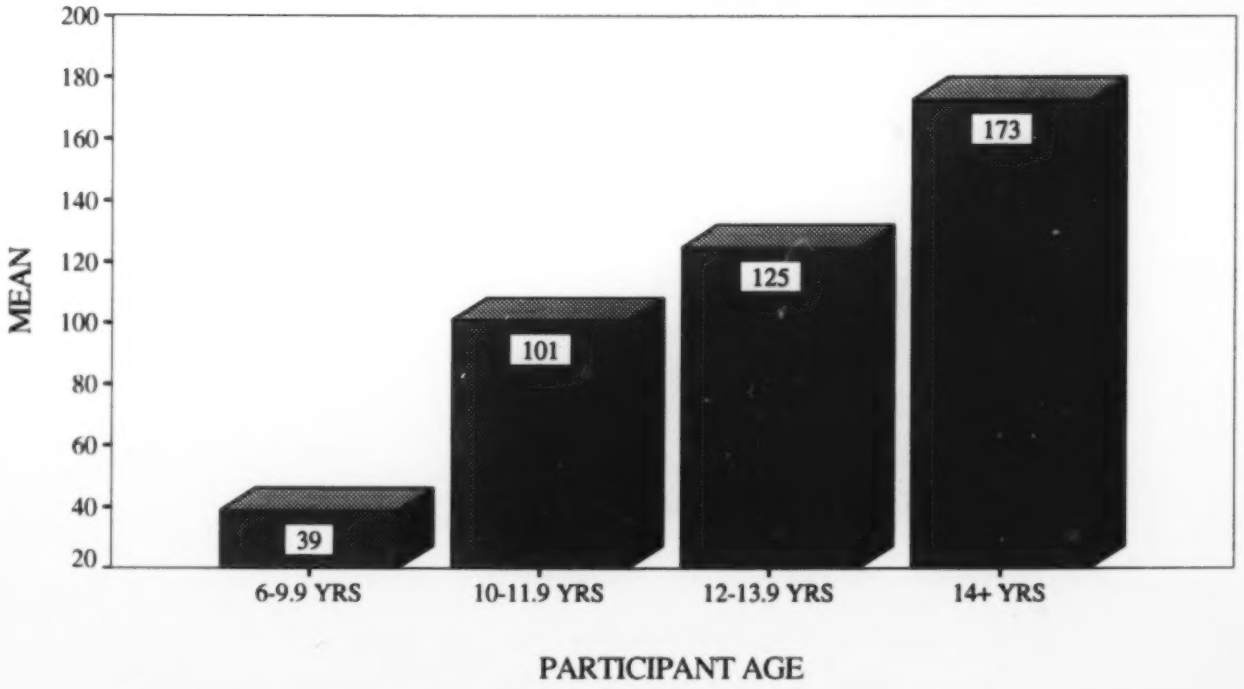
LAS 1993, Franciscan Montessori Earth School

Christopher M. Glenn, Ph.D.

GRAPH 2

MEAN MINUTES OF CHORES PER WEEK

CONTROLLING FOR MEY AND STATUS



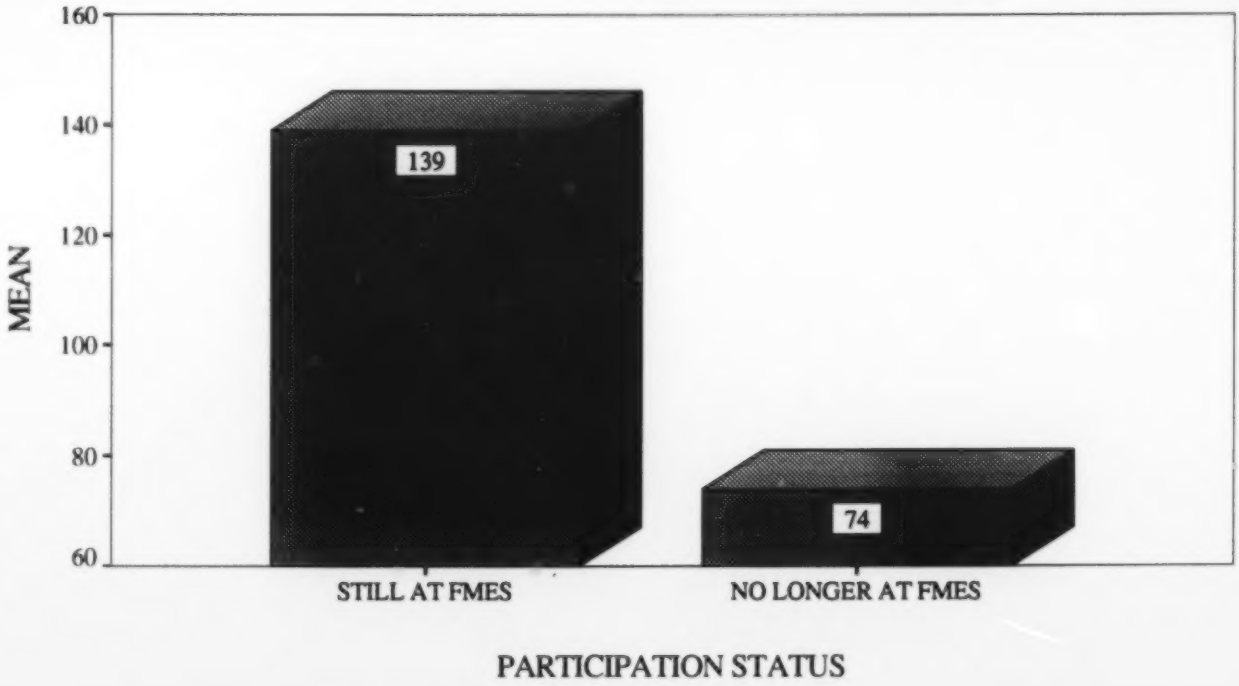
LAS 1993, Franciscan Montessori Earth School

Christopher M. Glenn, Ph.D.

GRAPH 3

MEAN MINUTES OF CHORES PER WEEK

CONTROLLING FOR MEY AND AGE



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